CLAIMS

What is claimed is:

1   1.   In a client computer system, a method of operation comprising:

2   determining operating characteristic value(s) for at least one operating

3   characteristic of the client computer system;

4   adaptively requesting streaming of model data from a remote content

5   providing server, based at least in part on the determined operating characteristic

6   value(s) of the at least one operating characteristic of the client computer system.

1   2.   The method of claim 1, wherein the at least one operating characteristic

2   comprises one or more operating characteristics selected from a group consisting of

3   communication bandwidth, processor power, availability of memory, availability of

4   swap space, memory and bus speed, availability of video memory, availability of

5   digital signal processing for audio decompression, and availability of graphics

6   acceleration.

1   3.   The method of claim 1, wherein said determining is performed as an integral

2   part of an installation of a multi-media content player, and said adaptively requesting

3   streaming of model data is performed by said multi-media content player.

1   4.   The method of claim 1, wherein said model data comprise of data selected

2   from a group consisting of geometry data, lighting data, coloring data, texturing data,

3   animation data, and audio data.

1   5.   The method of claim 1, wherein said adaptively requesting of streaming of

2   model data comprises adaptively requesting the remote content providing server for

3   different versions of the model data based at least in part on the determined

4   operating characteristic value(s) of the at least one operating characteristic of the

5   client computer system.

1   6.   The method of claim 1, wherein the method further comprises monitoring at

2   least one performance indicator for the client computer system.

1   7.   The method of claim 6, wherein said at least one performance indicator

2   comprises one or more selected from a group consisting of bandwidth utilization,

3   CPU utilization, memory utilization, memory swapping, cache hit rate, and audio

4   frames drop rate.

1   8.   The method of claim 6, wherein said adaptively requesting of streaming of

2   model data comprises switching to requesting the remote content providing server

3   for higher precision versions of the model data, responsive to indicator value(s) of

4   the monitored at least one performance indicator.

1   9.   The method of claim 6, wherein said adaptively requesting of streaming of

2   model data comprises switching to requesting the remote content providing server

3   for lower precision versions of the model data, responsive to indicator value(s) of the

4   monitored at least one performance indicator.

1   10.   The method of claim 1, wherein the method further comprises automatically

2   synchronizing rendering of the received model data in accordance with the

3   timeliness of the receipt of the model data.

1   11.   The method of claim 10, wherein said automatic synchronization of rendering

2   of the received model data comprises dropping audio data in proportional to the

3   amount of the time the audio data arrived late.

1   12.   A client computer system comprising:

          a processor to execute programming instructions; and

          a storage medium, coupled to the processor, having stored therein a first and

4   a second plurality of programming instructions to be executed by the processor, the

5   first plurality of programming instructions, when executed, determine operating

6   characteristic value(s) for at least one operating characteristic of the client computer
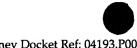
7   system, and the second plurality of programming instructions, when executed,

8   adaptively request streaming of model data from a remote content providing server,

9   based at least in part on the determined operating characteristic value(s) of the at

10   least one operating characteristic of the client computer system.

1   13.   The client computer system of claim 12, wherein the at least one operating

2   characteristic comprises one or more operating characteristics selected from a

3   group consisting of communication bandwidth, processor power, availability of

4   memory, availability of swap space, memory and bus speed, availability of video

5   memory, availability of digital signal processing for audio decompression, and

6   availability of graphics acceleration.

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1   14.   The client computer system of claim 12, wherein the first and second plurality

2   of programming instructions implement a multi-media content player, and said first

3   plurality of programming instructions are executed when the first and second

4   plurality of programming instructions are installed on said client computer system,

5 · and when the second plurality of programming instructions are executed to

6   download a multi-media title.

1   15.   The client computer system of claim 12, wherein said model data comprise of

2   data selected from a group consisting of geometry data, lighting data, coloring data,

3   texturing data, animation data, and audio data.

1   16.   The client computer system of claim 12, wherein when executed, said second

2   plurality of programming instructions adaptively request the remote content providing

3   server for different versions of the model data based at least in part on the

4   determined operating characteristic value(s) of the at least one operating

5   characteristic of the client computer system.

1   17.   The client computer system of claim 12, wherein the second plurality of

2   programming instructions further monitor at least one performance indicator for the

3   client computer system.

1   18.   The client computer system of claim 17, wherein said at least one

2   performance indicator comprises one or more selected from a group consisting of

3   bandwidth utilization, CPU utilization, memory utilization, memory swapping, cache

4   hit rate, and audio frames drop rate.

1   19.   The client computer system of claim 17, wherein when executed, said second

2   plurality of programming instructions switch to requesting the remote content

3   providing server for higher precision versions of the model data, responsive to

4   indicator value(s) of the monitored at least one performance indicator.

1   20.   The client computer system of claim 17, wherein when executed, said second

2   plurality of programming instructions switch to requesting the remote content

3   providing server for lower precision versions of the model data, responsive to

4   indicator value(s) of the monitored at least one performance indicator.

1   21.   The client computer system of claim 12, wherein when executed, said second

2   plurality of programming instructions further automatically synchronize rendering of

3   the received model data based at least in part on the timeliness of the receipt of the

4   model data.

22.   The client computer system of claim 21, wherein when executed, said second

plurality of programming instructions automatically drop audio data in proportional to
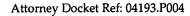
3   the amount of the time the audio data arrived late.

23.   In a computer server, a method of operation comprising:

storing multiple versions of model data tailored for different operating

environments differentiated in accordance with value(s) of at least one operating

4   characteristic of a remote requesting client computer system;

5   accepting requests for said model data that includes version selection

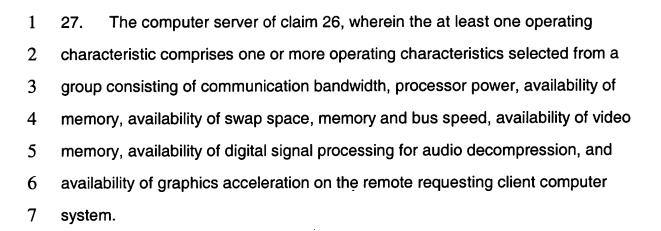6   designations from the remote requesting client computer system; and

7   streaming the requested versions of the model data to the remote requesting

8   client computer system, responsive to the accepted requests.

1   24.   The method of claim 23, wherein the at least one operating characteristic

2   comprises one or more operating characteristics selected from a group consisting of

3   communication bandwidth, processor power, availability of memory, availability of

4   swap space, memory and bus speed, availability of video memory, availability of

5   digital signal processing for audio decompression, and availability of graphics

6   acceleration on the remote requesting client computer system.

25.   The method of claim 23, wherein said model data comprise of data selected

from a group consisting of geometry data, lighting data, coloring data, texturing data,

3   animation data, and audio data.

26.   A computer server comprising:

a processor to execute programming instructions; and

a storage medium, coupled to the processor, having stored therein multiple

4   versions of model data tailored for different operating environments differentiated in

5   accordance with value(s) of at least one operating characteristic of a remote

6   requesting client computer system, and a plurality of programming instructions,

7   when executed, accept requests for said model data that includes version selection

8   designations from the remote requesting client computer system, and

9   stream the requested versions of the model data to the remote requesting client

10   computer system, responsive to the accepted requests.

1   27.   The computer server of claim 26, wherein the at least one operating

2   characteristic comprises one or more operating characteristics selected from a

3   group consisting of communication bandwidth, processor power, availability of

4   memory, availability of swap space, memory and bus speed, availability of video

5   memory, availability of digital signal processing for audio decompression, and

6   availability of graphics acceleration on the remote requesting client computer

7   system.

1   28.   The computer server of claim 26, wherein said model data comprise of data

2   selected from a group consisting of geometry data, lighting data, coloring data,

3   texturing data, animation data, and audio data.

29.   A method for streaming multi-media content comprising:

storing by a multi-media content providing server, multiple versions of model

data tailored for different operating environments differentiated in accordance with

4   value(s) of at least one operating characteristic of a remote requesting client

5   computer system;

6   determining by a multi-media content player of the remote requesting client

7   computer system, operating characteristic value(s) for at least one operating

8   characteristic of the remote requesting client computer system;

9   adaptively requesting by the multi-media content player, different versions of

10   model data from the multi-media content providing server, based at least in part on

11   the determined operating characteristic value(s) of the at least one operating

12   characteristic of the remote requesting client computer system; and

13   streaming by the multi-media content providing server, the requested

14   versions of the model data, responsive to the requests of the multi-media content

15   player.

1   30.   The method of claim 29, wherein said determining is performed as an integral

2   part of an installation of a multi-media content player, and re-performed by the multi-

3   media content player at download time of a multi-media title.

1   31.   The method of claim 29, wherein the method further comprises monitoring by

2   the multi-media content player, at least one performance indicator for the remote

3   requesting client computer system.

1   32.   The method of claim 31, wherein said adaptively requesting by the multi-

2   media content player comprises switching to requesting the multi-media content

3   providing server for higher precision versions of the model data, responsive to

4   indicator value(s) of the monitored at least one performance indicator.

1   33.   The method of claim 31, wherein by the multi-media content player comprises

2   switching to requesting the multi-media content providing server for lower precision

3   versions of the model data, responsive to indicator value(s) of the monitored at least

4   one performance indicator.

1   34.   The method of claim 29, wherein the method further comprises automatically

2   synchronizing by the multi-media player, rendering of the received model data

3   based at least in part on the timeliness of the receipt of the model data.